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Hyginus rill crossing the floor of the *Hyginus* crater. So far as I know, this has only been once seen. The observation is a delicate one, and could only be made when the sun is shining nearly in the direction of the preceding branch of the rill. The walls inside the crater are hardly more than 2000 yards apart, and their bright tops are not more than 200 to 220 yards wide. Yet they are plainly and obviously visible in this enlargement.

From this single example (among many others which could be given), it is possible to form a judgment of the results which a competent selenographer could draw from a series of our Moon negatives. I have no hesitation in saying that a two or three years' study of such a series would produce greater results than all the previous work of observers in this line, great as these results have been. Unfortunately, the limited force at the Lick Observatory will not permit us to undertake anything more than the production of the negatives themselves. By depositing sets of these at certain scientific centers, they will be sure, sooner or later, to be studied by competent observers who have the necessary leisure.

PHYSICAL OBSERVATIONS OF *JUPITER* IN 1889.

BY J. E. KEELER.

[ABSTRACT.]

Mr. KEELER exhibited a series of twenty-four drawings of *Jupiter*, made during the opposition of 1889, with the thirty-six-inch equatorial of the Lick Observatory. The drawings were made on a large scale, the elliptical outline of the planet being 3.50×3.30 inches, and were intended to show all the details that could be perceived with the telescope and transferred to paper in the limited time allowed by the rotation of the planet, (about fifteen or twenty minutes). All dimensions were mere eye estimates, but they had been checked by micrometer measurements and found to be fairly accurate. Reference was made to the extremely satisfactory views obtained with the great telescope and a *résumé* given of the different kinds of astronomical work in which the instrument had proved to be efficient.

The equatorial zone of *Jupiter* was brilliant white at the edges, with a salmon-pink central stripe, which the measurements showed to be a trifle south of the equator. From the edges of the zone

long streamers projected at certain places into the red belts, with which they eventually became parallel, and gradually becoming more diffuse, were lost in the general red color of the background. These streamers, which are doubtless the cause of the double and triple appearance of the red belts, often described, were, according to the observations, masses of clouds projected outward from the equatorial zone, and gradually left behind by the forward drift of that region. Two were frequently seen abreast, but never three. The roots of the streamers were brighter than the average surface of the equatorial zone, and were usually tinged with a curious olive-green color, which seemed to be characteristic of great disturbance. At certain parts of the equatorial zone, the streamers were sometimes considerably distorted, but when long they invariably pointed toward the following limb of the planet. Observations of bright knots on the streamers showed that there was a flow of matter along them from the root outward.

The Red Spot was frequently well seen. It was shorter than in 1881. The color was a pale pink, lighter in the middle of the spot. At the following end, the outline was marked by a faint dark shading.

On a broad, uniformly-tinted, gray belt on the southern hemisphere, following the Red Spot, were many oval and round brilliant white spots, forming one of the most beautiful features of the surface of *Jupiter*. A curious symmetry was often observed in the grouping of these spots, which are shown in nearly all of the drawings.

On the northern hemisphere the details were much simpler, and the belts were of the usual form. Bright white spots like those described above were never seen. As in former years, the greatest activity seems to be manifested south of the equator.

BRIGHT METEOR SEEN JANUARY 1, 1890.

[ABSTRACT.]

Mr. PERRINE gave the following description of a bright meteor seen by him in Alameda, between 10^h and 10^h 5^m P. M., on January 1st. It first appeared in the northern sky, at an altitude of 35°–40°, and then moved southward, within 10°–15° of the zenith, disappearing at an altitude of about 45° above the southern horizon.

The head was very bright, and the long, bright train was fully 45° in length. The train remained visible for five seconds or so. No noise was heard.

C. D. PERRINE.